树鼩生物化学及免疫学参考值*

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树鼩科(Tupaiidae) 的分类学地位尚有争议。一些学者认为,它是灵长类中分类地位最低的类群。谷圃功邦等(1979)把它归属灵长目,原壤亚目。近年来,树鼩在生物学和医学研究中的应用,日趋广泛。有关树鼩生建指标的报道着重于血象,(Braun和Kloft, 1965, Hunt和Chalifoux, 1967, 邹如金等,1983, 周化愚等,1983)。生化方面数值的测定,仅见Braun & Kloft一文中附带报道了血清蛋白电泳成分的百分比,Schwaier等(1979)以树鼩为胆结石动物模型的研究中,报告了对照组24只雌性动物的8项血液生化值,戴长柏等(1983)报道了云南树鼩血清蛋白 电泳的分析。本文利用经驯养的云南树鼩(Tupaia belangeri chinensis),测定了33项生化及免疫学的数值或反应,供研究工作参考。

材料与方法

一、动物来源

引自昆明动物研究所,均为野生。在上海生理研究所饲养1年以上。共选用雕性17 只,雄性18只。外观被毛光泽,行动灵敏,无外伤和异常。体重100—130 g

二、实验条件

1. 饲养条件 饲养室为开放系统,自然光照。笼养,每笼1-3只。室温10-30℃ 相对温度除个别天敷外,控制在50-70%。噪音低于60dB。 混合粉料制成固形 饲料, 上、下午各喂1次,每只每次10g。苹果1天2次,每次25g。每周加喂鸡蛋、肉类2次,每次各15g,及鱼肝油外涂于固形饲料2次。多种维生素粉剂溶于瓶装自来水,任

本文乙型肝炎衰雨抗原测定的ELISA部分及抗乙型肝炎衰固抗原的抗体测定,为上等市医学化验所检测;本工作还得到上海生理研究所模松明、黄华玉闹志的帮助。進此數據。

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意播食.

- 2.血标本制备 空腹无麻醉情况下,颈静脉放血时接血。血清标本清晰,无溶血现象。各实验均于标本制备后立即进行。每一项目所用动物均为取血样一次。
- 3.测定方法 各项目测试方法分别列于表 1 5 内相应栏。仪器均为国产。试剂绝大部分为国产分析纯。氨基黑10B为E. Merck产品。甲种胎儿蛋白(AFP)抗血清为上海生物制品研究所产品。检测乙型肝炎表面抗原(HBSAg)和抗乙型肝炎表面抗原的抗体(Anti-HBs)的间接反应血凝法(RPHA, PHA)试剂及酶标测定成套试剂(ELISA Kits)为上海市医学化验所产品。

测试的结果, 经统计学 t 测验处理, 判明两性间均数差异的显著性。

结果和讨论

测试项目按类别分列表1一5。

蛋白电泳的图象见图 1。

如前所述,能查到的树鼩血液生化值的报道甚少,仅就这少数的报告作一些比较。 Braun&Kloft (1965) 用泰国产树鼩 (T. tana) 为材料,作蛋白电泳分析, 3次得出的结果差异甚大,我们取其平均值, 连同戴长柏等 (1983) 的报道与本文的结果,列表 6 作比较。

由表 6 可见,本文的结果与戴氏的报道相较,除 Y-球蛋白的含量有较明显的 差 异外,其余均比较接近;而与Braun & Kloft (1965)的报道相比,相差较大。 戴 氏 曾 指 出,树黝蛋白电泳的电压低于120V或高于150V时,分离效果不甚理想。我们用 上 海医药公司医疗器械批发部修配厂生产的722型电泳仪,电压 170V, 25 分钟,效果良好,分带清楚。同样用该电泳仪分析恒河猴和树黝的蛋白成分表明,白蛋白、 a.、 a. 球蛋白的百分比两者很接近; β 球蛋白的含量树黝比恒河猴高,而 Y 球蛋白的含量恒河猴较树鼩高(丁正梁等,1983)。

总胆固醇的含量,本文结果与Schwaier等(1979)报道者非常接近,而与余铭鹏等(1983)所报道的192.9 ± 47.2 mg/di差异很大。血红蛋白的测定,我们的结果,雌性者与周化愚等(1983)及Hunt&Chalifoux(1967)的报道接近,比邹如金等(1983)报道者低,而雄性者以周氏的结果最低,邹氏的结果最高,本文与Hunt&Chalifoux(1967)的报道非常接近。Schwaier(1979)等报告的8项生化值中,除总脂类及γ-谷氨酰转移酶(r-GT)我们未做外,总胆固醇的比较已如上述,胆红素和肌酐的含量,经换算后,我们的结果稍高。其余SGOT、SGPT及AKP的比较,由于彼此间所用方法及表示的单位不同,无法换算,不能比较。我们曾测定血清无机磷的含量,由于所用雄性树獭仅2只,因此,未将雌雄间的区别分列表内(见表2)。

庞其方等(1981)在树黝感染乙型肝炎病毒研究时,发现对照组5只中有1只出现HBSAg阳性。火箭电泳放射自显影(RREA)和RPHA-电镜反复验证为阴性。这与我们的RPHA测定出现个别动物非特异性凝集相吻合,值得引起注意。

Table 1	Biochemical Reference Values in Tupaia belangeri chinensis	alues in	Tupaia	belanger	ri chinensi	Ś	
Test	Method	Sex	No. of animals	×	SD	Actual range	t test
		*0+	25	132.6	44.2	50-210mg/dl	
	O-teluidine method	ot	a	108.3	40.8	72.9-210mg/dl	P>0.05
Serum Bincose		8	91	139.7	52.9	50-205mg/dl	
1 1 1 1		*04	22	18.5	5.4	8 -28.8mg/dl	
日本 外 元 元	Modified discetylmonoxime	아	11	17.4	2.5	11.2-28.8mg/dl	P>0.05
ocrum urea nitrogen	color method	ъ	11	19.4	5.3	8-25.9mg/dl	
	Market State W	**	==	1.8	0.4	1-2.1mg/dl	
	Modified sodium surproparmitate	아	LO.	1.6	0.3	1-1.8mg/di	P < 0.01
Scrum creatinine	direct method	8	9	2.1	0.2	1.7-2.1mg/dl	
1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	C. Statistical C.	404	24	87.9	21.8	51.2-140.9mg/dl	
Constant both of classical		아	12	103	15.3	90.9-140.9mg/dl	P<0.001
Ciam (ctal cholostero)	COTOL METHOD	ъ	12	72.7	16	51.2-97.7mg/dl	
2011年本章王		* 0↔	14	37.2	10.2	19.5-62.5mg/dl	
Contract total	Acetylacetone color method	아	4	46.9	10.7	40-62.5mg/dl	0.05>P>0.01
Scient Helycologs		ъ	10	33.5	e0 10	19.5-51.2mg/dl	
石 的 83. 一 2		*0	14	96.1	24.8	63,1-136.8mg/dl	
Commen Rationardain	Cholesterol conversion	아	9	90.9	28	68.2-126.6mg/dl	P>0.05
manadadir d mina	:	ъ	80	66.6	23.2	63.1-136.8mg/dl	
1000年	Cvanmathaman	\$ 0+	11	14.1	2.8	9.8-19.5g/dl	
	High grant for the formation of	아	ь	12.9	8.	9.8-16.4g/dl	P>0.05
2	compared protectifically	ъ	9	12	2.7	12.9-19.50/dl	

Table 2	Reference Values of Serum Electrolytes in Tupaia belangeri chinensis	Values of	f Serum	Electro	ytes in	Tupaia	belangeri	chiner	1515	
Test		Method		Sex	No. of animals	j⊭	SS		Actual range	t test
* # #	Sodium te	Sodium tetraphenylboron	200	\$0	13	ec	0.85		6.6-9.4mEq/L	
Serum potassium	tur	turbidimetry		o+ *5	4 0	9.6	0.92		7.6-9.4mEq/L 6.6-8.5mEq/L	P>0.05
			1	\$0¢	13	159	8.87		145-171.4mEq/L	
多 海 哥	Magnesiur	Magnesium uranyl acetate	tate	o ļ	1	157	8.48		145-163.7mEq/L	P >0.05
Serum sodium	8	colorimetry		ъ	w	161.3	9.43		145.7-171.4mEq/L	
	110			\$04	16	78.5	9.97		65-95.1mEq/L	
	OCHRICS O	ocuates of ocuates method	2001	0+	#	74.6	8.82		65-90mEq/L	P<0.001
Service colorides	mercuric	mercuric nitrate titration	non	ъ	9	200	6.73		80-95.1mEq/L	
1				404	77	3.9	0.3		3.6-4.4mEq/L	
	EDTA	EDTA Na2 titration	pi o	o t	10	ec •	0.25		3.6-4.4mEq/L	0.05>P>0.01
OFFILE CALCIUM				ъ	*	1.1	0.15		4-4.3mEq/L	
医 3 3 3 4 4 4 Serum inorganic	Metol	Metol method		*6 0+	13	22	0.09		1.4-8.1mEq/L	

本等金一所等金額 Reinam-Frankel's 우 17 30.8 18 12—7 6 units/ml P>0.05	Test	Method	Š	No. of animals	×	SD	Actual range	t test
Keilman-Frankel's			*0+	83	32.8	14.5	12-7 6units/ml	
Por 16 123.4 29 82-190 units/ml	機械 地名一角 発音	Keitman-Frankel's method	아	17	80.8	18	12-76 units/ml	P>0.0
φφ ^r 16 123.4 29 82—190 units/ml φ ^r 8 134.9 36.5 82—190 units/ml phenolophihalein method φ ^r 19 2.7 5.6 0—19.7 units/L phenolophihalein method φ ^r 14 3.5 6.4 0—19.7 units/L φ ^r 16 3.8 3.2 0—2.9 units/L φ ^r 16 3.8 3.2 0—2.9 units/L φ ^r 18 6.7 0.4 6.2-7.4 units/L port 8 6.7 0.4 6.2-7.4 units/L Kunkel method φ ^r 19 0.6 0.9 0—2 units Kunkel method φ ^r 19 0.6 0.9 0—2 units vort 18 17 All below 3 units vort			ъ	16	37.8	14	17-76 units/ml	
Part of the phosphate of the phos			\$0 \$	16	123.4	29	82-190 units/ml	
Thymol phosphate—	目前40十一种数型器 SCOT		아	60	112	13,3	92-135 units/ml	P>0.0
Thymol phosphate- φσ			ъ	œ	134.9	36.5	82-190 units/ml	
Thymol phosphate			4	18	2.7	9.6	0-19.7 units/L	
Modified Maclagan's method φσ' 14 3.5 6.4 0-19.7units/L φσ' 16 3.8 3.2 0-7.4 units/L σ' 8 1 1.8 0-3.9units/L σ' 8 6.7 0.4 6.2-7.4 units/L φσ' 28 0.6 0.9 0-2 units σ' 19 0.6 0.8 0-2 units σ' 19 0.6 0.8 0-3 units σ' 19 0.6 0.9 0-3 units<	司紀教在律教群 AKD	Thymol phosphate- phenolophthalein method	아	10	9.0	1.3	0 - 3 units/L	P>0.0
φω' 16 3.8 3.2 0 -7.4 units/L φ' 8 1 1.8 0 -3.9mits/L φ' 28 0.6 0.9 0 -2 units method φ' 19 0.8 1 0 -2 units Kunkel method φ' 19 0.6 0.9 0 -2 units Modified Meulengracht's φ' 19 0.6 0.9 0 -3 units method φ' 19 0.6 1 0 -3 units σ' 19 0.4 0.7 0 -3 units σ' 18 17 All below 3 units σ' 18 17 All below 2 units σ' 18 17 18 17 σ' 10 2 1 1 σ' 10 <td></td> <td></td> <td>ъ</td> <td>11</td> <td>3.5</td> <td>6.4</td> <td>0-19.7units/L</td> <td></td>			ъ	11	3.5	6.4	0-19.7units/L	
Modified Maclagan's method \$\rightarrow{2}{8}\$ \$1 1.8 \$0\$-3.9mits/L Modified Maclagan's method \$\rightarrow{2}{9}\$ \$0.6 \$0.9 \$0\$-2\$ units Kunkel method \$\rightarrow{2}{9}\$ \$0.8 \$1\$ \$0\$-2\$ units Modified Meulengracht's method \$\rightarrow{2}{9}\$ \$0.4 \$0.7 \$0\$-2\$ units Modified Meulengracht's method \$\rightarrow{2}{9}\$ \$19\$ \$0.4 \$0.7 \$0\$-2\$ units Modified Meulengracht's method \$\rightarrow{2}{9}\$ \$19\$ \$0.4 \$0.7 \$0\$-2\$ units Modified Meulengracht's method \$\rightarrow{2}{9}\$ \$17\$ All below 3 units \$0\$-3 units Van den Bergh Diazo \$\rightarrow{2}{9}\$ \$17\$ All below 3 units \$1\$ Van den Bergh sodium \$\rightarrow{2}{9}\$ \$17\$ All below 0.2 mg/dl Parazoate-urea solution \$\rightarrow{2}{9}\$ \$17\$ All below 0.2 mg/dl			*6	16	8.8	3.2	0-7.4 units/L	
Modified Maclagan's method \$\rho'\$ 28 0.6 0.9 0.2 units Kunkel method \$\rho'\$ 19 0.6 0.9 0.2 units Kunkel method \$\rho'\$ 19 0.6 0.8 0.2 units Modified Meulengracht's \$\rho'\$ 19 0.6 0.9 03 units Modified Meulengracht's \$\rho'\$ 19 0.6 1 03 units Modified Meulengracht's \$\rho'\$ 18 0.4 0.7 02 units O' 19 0.6 1 03 units Modified Meulengracht's \$\rho'\$ 18 0.4 0.7 02 units O' 19 0.6 1 0.0 1 units O' 19 0.6 1 03 units O' 18 17 All below 3 units O' 18 0.4 0.7 03 units O' 18 0.6 1 03 units O' 18 0.4	直接有代表的现在分词 VCD VCD		아	80	-	1.8	0 -3.9units/L	P < 0.0
Modified Maclagan's φο' 28 0.6 0.9 0 — 2 units Modified Meulengracht's φο' 19 0.6 0.8 0 — 2 units Modified Meulengracht's φο' 28 0.6 0.9 0 — 3 units Modified Meulengracht's φο' 36 1 0.6 1 0 — 3 units Modified Meulengracht's φο' 36 1 All below 3 units 0 — 3 units Van den Bergh Diazo φο' 36 1 All below 3 units Van den Bergh sodium φο' 36 1 Ingative, occasionally weak positive Van den Bergh sodium φο' 36 1 All below 0.2 mg/dl			ъ	90	6.7	0.4	6.2-7.4 units/L	
Modified Matlagan's P 9 0.8 1 0-2 units Kunkel method Por 28 0.6 0.8 0-3 units Modified Meulengracht's Por 9 0.4 0.7 0-2 units Modified Meulengracht's Por 35 17 All below 3 units 0-3 units Modified Meulengracht's Por 36 17 All below 3 units Van den Bergh Diazo Por 18 Direct reaction: all negative; Indirect reaction: reagent Van den Bergh sodium Por 36 17 All below 0.2 mg/dl Parazoate-urea solution Por 17 All below 0.2 mg/dl	1 1 1		₹ 0	28	9.6	0.0	EN]	
Kunkel method Portrol 28 0.6 0.8 0 - 3 units Modified Meulengracht's Portrol 9 0.4 0.7 0 - 2 units Modified Meulengracht's Portrol 35 17 All below 3 units Wan den Bergh Diazo Portrol 35 All below 3 units Van den Bergh Diazo Portrol 36 Van den Bergh sodium Portrol 36	建作中等数例 计11.1	Modified Maclagan's method	아	6	8.0			P>0.06
Kunkel method \$\rightarrow{\ri			ъ	3.9	9.0	0.8	60	
Kunkel method P 9 0.4 0.7 0-2 units Modified Meulengracht's method Por 35 35 17 All below 3 units Van den Bergh Diazo Por 36 36 All below 3 units Van den Bergh Diazo Por 36 36 Van den Bergh sodium Por 36 36 Van den Bergh sodium Por 36 Por 36 36 Van den Bergh sodium Por 36 Por 36 36 Van den Bergh sodium Por 36 Por 36 36			*O+	28	0.6	6.0	63	
Modified Meulengracht's \$9°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°	高東存在 2ntt	Kunkel method	아	6	1.0	0.7		P>0.0
Modified Meulengracht's φο' 35 method σ' 17 Van den Bergh Diazo φο' 18 Van den Bergh sodium φο' 35			ъ	18	9.0	eri.	ra 	
Modified Meulengracht's 9 17 method of 18 Van den Bergh Diazo 9 17 reagent 0 17 reagent 90 18 Van den Bergh sodium 9 17 henzoate-urea solition 9 17	; ;		*b	36				
van den Bergh Diazo	京 和 治 教	Modified Meulengracht's method	아	17	All belo	60		
Van den Bergh Diazo			ъ	18				
Van den Bergh sodium 2 17	是	Van den Becgh Diazo	404	35	i			[[
Van den Bergh sodium 20 17 herzoate-urea solition 2 17	Serum bilirubin (qualitative)	reagent	o -	17	Direct r	eaction: all negat	ive; Indirect reaction:	
Van den Bergh sodium 2 17	•		ъ	18	neg	ative, occasionall	y weak positive	
Van den Bergh sodium benzoate-urea solution	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		*6	36				
	自己 第二年 第二年 第二年 第二年 第二年 第二年 第二十二年 第二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十		아	17	All belo	ow 0.2 mg/dl		

anc) Motel 72 17.0 0.6 1.4 7.3 0.4 1.4 0.7 1.4 0.8 0.7 1.4 0.9 1.4 0.8 0.3 1.4 0.9 1.4 0.9 1.4 0.7 0.9 1.9 56.3 56.3 56.3 56.3 56.3 56.3 56.3 56.3	Table 4	Reference Values of Serum Pr	rotein	Fractions in	Tupaia	Tupaia belangeri chinensis	chinensis	
Brunctesol green colorimetry	Test	Method	Sex	No. of animals	×	S	Actual range	t test
日 Bromcresol green colorimetry や 5 3.3 0.7 14 2.9 0.7 15 3.3 0.7 16 2.9 0.7 17 0.4 18 2.9 0.7 19 0.8 14 4.4 0.9 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 15 0.1 17 0.1 18 0.1 18 0.1 18 0.1 18 0.1 18 0.1 18 0.1 18 0.1 18 0.1 19 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1	自識的製品 Serum total protein	Biuret	\$ 0+ 5	019 17	7.1 6.5 7.3	0.6	5.5-7.8 g/dl 5.5-7.3 g/dl 6.7-7.8 g/dl	P <0.001
日日 日比値 日比値 日比値 日比値 日比値 日比値 日比値 日	自業自然自 Serum albumin	Bromcresol green colorimetry	\$045	19	80 84 80 84	0.7	2.2—3.9 g/dl 2.8—3.7 g/dl 2.2—3.9 g/dl	P>0.05
(1) 0.8 0.3 (本分析 1) 0.8 0.3 (本分析 1) 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1	医球球球球型 Serum globulin		\$ 04.6	18	3.2	0.0	2.7—5.7 g/dl 2.7—3.7 g/dl 3.2—5.7 g/dl	0.05>P>0.01
本	白蛋白和球蛋白比值 A/G		ই প*১	19 61 14	0.8 1.1 0.7	000 000	0.4-1.2:1 0.9-1.1:1 0.4-1.2:1	P <0.01
中央 28 57.2 4.8 中央 28 59.2 4.8 56.3 5.2 4.8 中央 19 3.6 0.5 中央 19 5.3 3.5 中央 19 17.4 5.3 中央 28 17.2 4.9 中央 28 17.2 4.9 中央 28 17.1 5.3 中央 28 17.1 5.3 中央 28 17.1 5.3 中央 18 17.4 5.3	血清蛋白电泳分析 Serum protein analysis	Electrophoresis (Cellufose aceta	te membran	Q	Model 722	170 V. 26 min		
中で 28 3.8 1.2 中で 28 3.6 1.4 中で 28 4.7 3.5 中で 28 17.2 4.9 中で 28 17.1 5.3 中で 28 17.1 5.3 中で 28 17.1 5.3 中で 28 17.1 5.3 中で 28 17.1 5.3	V		\$ \$ \$	28 9 19	59.2	5.2 8.3 8.2	47.5-69% 56.5-69% 47.5-62.2%	P>0.05
中で 28 4.7 3.5 中で 9 5.3 3.5 で 19 4.4 3.6 中で 28 17.2 4.9 中で 9 16.1 6.3 中で 29 16.1 5.9 中で 28 17.1 5.9 中で 28 17.1 3.3 中で 28 17.1 3.3	ß.		\$ ቀቴ	28 19	8 8 9	40 H	1.5-6.7% 3.1-4.3% 1.5-6.7%	P>0.05
中で 28 17.2 4.9 中 9 16.1 6.3 中 9 17.4 6. 中 28 17.1 3.3 中 2 17.1 3.3 中 4 9 17.8 2.9	a ₂		* o+ b	8 e et	5.3	00 00 10 10 00	1.3-10.6% 210.4% 1.3-10.6%	P>0.05
+0. 28 17.1 3.3 +0. 9 15.9 3.6 -0. 19 17.8 2.9	6		\$ 04 %	28 01 10	17.2 16.1 17.4	9.00	10.3—25.6% 10.3—25.6% 11.2—24%	P>0.05
21	>-		å ቀ ቀ የ	28 9 19	17.1	8. 50 8. 60 8. 60	10.7—23.6% 10.7—21.5% 13—23.6%	P>0.05

表 5 树 鼩 免 疫 反 应 測 定
Table 5 Test of Immuno-reaction in Tupaia belangeri chinensis

Test	Method	Sex	No. of anim	als Result
乙型肝炎表面 抗原 測 定	Reversed passive hemagglutination (RPHA)	우 o* 우 o*	35 17 18	All negative, occasionly non-specific agglutination
HBSAg	Enzyme linked immuno-sorbent assay (ELJSA)	우 o*	11 5	All negative
抗乙型肝炎表面 抗原的抗体侧定 Anti-HBS	Passive hemagglutination (PHA)	우ơ ⁴ 우 ơ ⁴	11 5 6	All negative
甲种胎儿蛋白测定 AFP	Counterimmunc-electrophoresis	우ơ* 우 ơ*	24 12 12	All negative

表 6 树 黝 血 清 蛋 白 成 分 比 较 (%).
Table 6 Comparison of Serum Protein Fractions in Tupaia belangeri chinensis

Authors	Sex	A	α_1	a ₂	β	Υ ,
n	9	59.2 ± 4.8	3.6±0.5	5.3±3.5	16.1 ± 5.3	15,9±3,6
Present	o ^r	56.3±5.2	3.9 ± 1.4	4.4±3.6	17.4± 5	17,8±2,9
D. a VI-6 (1945)	우	29.7	6	12	14.3	28
Braun & Kloft (1966)	o*	35.5	5	20.3	20.3	19 '
D : Cl	우	61.1±5.7	3.6±0.6	4.5±0.5	18.3±3	12,5±2
Dai Changbai et al. (1983)	o*	59.2 ± 7.9	4.2 ± 0.9	4.9±0.9	19.4±2.7	12.3 ± 2.2

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BIOCHEMICAL & IMMUNOLOGICAL REFERENCE VALUES IN THE TREESHREW (TUPAIA BELANGERI CHINENSIS)

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The wild-caught treeshrews were introduced from Kunming Institute of Zoology and domesticated for more than I year in Shanghai. The 17 females and 18 males with a body weight from 100—130 g and in good physical condition were used. The animals were kept in room with open system and natural light. The room temperature was 10—30°C, the relative humidity ranged between 50% and 70%, and the noise was controlled below 60 dB. The treeshrews were reared in cages housing 1—3 animals each and fed with a locally prepared pelleted diet, supplemented with fresh apples daily, eggs, meat, and cod liver oil twice a week. Tap water dissolved with vitamins was offered ad libitum. Blood samples were obtained by cervical vein bleeding before feeding.

A total of 33 items were tested. The methods used in these tests are shown in corresponding column of the tables.

The results are presented in Table 1-5, whereas the comparison of serum protein fractions among different authors is summarized in Table 6.

The electrophoretic pattern of serum protein is illustrated in Fig. 1. The results are discussed and compared with relevant papers.

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